
बेकिंग पाउडर — विशिष्टि

(दूसरा पुनरीक्षण)

Baking Powder — Specification

(Second Revision)

ICS 67.060

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FOREWORD

This Indian Standard (Second Revision) was adopted by the Bureau of Indian Standards, after the draft finalized by the Ready-to-Eat Foods and Specialised Products Sectional Committee had been approved by the Food and Agriculture Division Council.

Baking powder finds widespread use as a 'chemical leavener' of dough for bakery products. The constituents of baking powder are, sodium bicarbonate; edible starch; and acid reacting component.

On wetting, baking powder produces carbon dioxide by the action of acid reacting component on sodium bicarbonate.

This Indian Standard was first published in 1957 and then revised in 1981. In the first revision, the requirement for carbon dioxide was increased, and that for copper, zinc and tin had been deleted. A list of edible starches which may be used was listed. In addition, an alternate method for the determination of carbon dioxide was also included.

This revision (*second revision*) has been brought out to align the requirements of baking powder with the specifications laid down in *Food Safety and Standards (Food Products Standards and Food Additives) Regulations, 2011* and following are the major changes in this revision:

- a) Requirements for arsenic and lead have been revised;
- b) Requirement for moisture content has been incorporated;
- c) Additional test methods for arsenic and lead have been prescribed; and
- d) Additional acid reacting components that may be used have been listed.

A scheme for labelling environment friendly products to be known as ECO Mark is being introduced at the instance of the Ministry of Environment and Forests (MEF), Government of India. The ECO Mark shall be administered by the Bureau of Indian Standards (BIS) under the *Bureau of Indian Standards Act, 2016* as per the Resolution No.71 dated 20 February 1991 as published in the Gazette of the Government of India vide GSR No. 85 (E) dated 21 February 1991. For a product to be eligible for marking with ECO Mark it shall also carry the Standard Mark of BIS for quality besides meeting additional optional environment friendly (EF) requirements. The EF requirements for Baking Powder is based on Gazette Notification No. 215 (E) dated 17 May 1996 for labelling Food Additives as environment friendly products, published by the Ministry of Environment and Forests.

While formulating this standard, necessary consideration has been given to the relevant rules prescribed by the Government of India under the *Food Safety and Standards Act, 2006* and the rules framed thereunder and the *Legal Metrology (Packaged Commodities) Rules, 2011*. This standard is however, subject to the restriction imposed under these, wherever applicable.

The composition of the committee responsible for the formulation of this standard is listed in Annex D.

For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS 2 : 2022 'Rules for rounding off numerical values (*second revision*)'. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

Indian Standard

BAKING POWDER — SPECIFICATION

(*Second Revision*)

1 SCOPE

This standard prescribes the requirements and the methods of sampling and test for baking powder.

2 REFERENCES

The standards listed in Annex A contain provisions which, through reference in this text, constitute provisions of this standard. At the time of publication, the editions indicated were valid. All standards are subject to revision and parties to agreements based on this standard are encouraged to investigate the possibility of applying the most recent editions of these standards listed in Annex A.

3 REQUIREMENTS

3.1 Description

The product shall be in the form of a free-flowing, whitish powder and free from any off odour. It shall be free from dirt, insect or fungus infestation and adulterants. It shall also be free from any other harmful or injurious foreign matter.

NOTE — The appearance and odour shall be determined by organoleptic tests.

3.2 Ingredients

3.2.1 Baking powder shall contain the following materials:

3.2.1.1 *Sodium bicarbonate* (see IS 2124).

3.2.1.2 *Edible starches and neutral materials*

Edible such as maize starch (see IS 1005), tapioca starch (see IS 1319), rice starch, wheat starch, arrowroot starch (see IS 1006), potato starch, sorghum starch or other neutral material such as calcium lactate, anhydrous calcium sulphate, sodium sulphate and other similar compounds such as gamma-delta lactone, acid pectin etc. shall be used.

3.2.1.3 *Acid reacting component*

The acid reacting component, shall be free from flavour. It shall be any one or a combination of the following:

- a) Sodium acid pyrophosphate with or without mono acid calcium phosphate;
- b) Mono acid calcium phosphate with or without dicalcium orthophosphate;

- c) Potassium hydrogen tartrate or tartaric acid or a mixture of both;
- d) Acid compounds of aluminium;
- e) Glucono delta lactone;
- f) Sodium aluminum phosphate;
- g) Ammonium di-hydrogen phosphate;
- h) Calcium carbonate;
- j) Calcium silicate; and
- k) Tri-Calcium phosphate.

3.3 The material shall also conform with the requirements given in Table 1.

3.4 Additional Criteria for ECO Mark

3.4.1 General Requirements

3.4.1.1 Baking powder shall meet the requirements as specified under clause 3.1 to 3.3.

3.4.1.2 The product manufacturer shall produce the consent clearance as per the provisions of *Water (PCP) Act, 1974*, *Water (PCP) Cess Act, 1977* and *Air (PCP) Act, 1981* along with the authorization if required under the *Environment (Protection) Act, 1986* and the Rules made thereunder to *Bureau of Indian Standards* while applying for the Eco Mark and the product, shall also be in accordance with the *Food Standards and Safety Act, 2006* and the rules made thereunder.

3.4.1.3 The product/packing may display in brief the criteria based on which the product has been labelled as Environment Friendly.

3.4.1.4 The material used for product packing shall be recyclable or biodegradable.

3.4.1.5 The date of manufacture and date of expiry shall be declared on the product package by the manufacturer.

3.4.1.6 The product package or leaflet accompanying it may display instructions of proper use and storage so as to maximize the product performance, safety and minimize wastage.

3.5 Hygienic Conditions

The product shall be manufactured and packed under hygienic conditions as per IS 2491.

4 PACKING

The product shall be packed in clean, sound and air-tight containers. The packaging material that comes into contact with the product shall be of food grade.

5 MARKING

5.1 Each container shall be legibly and indelibly marked with the following particulars:

- a) Name of the product and brand name, if any;
- b) Name and address of the manufacturer;
- c) Date of manufacturing or packing;
- d) Batch or Code number;
- e) Net quantity;
- f) Expiry date;
- g) Directions for storage;
- h) Directions for use; and
- j) Any other requirements under the *Legal Metrology (Packaged Commodities) Rules, 2011* and the *Food Safety and Standards (Labelling and Display) Regulations, 2020*.

5.2 BIS Certification Marking

The product(s) conforming to the requirements of this

standard may be certified as per the conformity assessment schemes under the provisions of the *Bureau of Indian Standards Act, 2016* and the Rules and Regulations framed thereunder, and the products may be marked with the Standard Mark.

6 SAMPLING

Representative samples of the material shall be drawn and their conformity to that standard shall be determined in accordance with the method prescribed in Annex C.

7 TESTS

7.1 Tests shall be carried out as prescribed in col (4) of Table 1.

7.2 Quality of Reagents

Unless specified otherwise, pure chemicals shall be employed in tests and distilled water (*see* IS 1070) shall be used where the use of water as reagent is intended.

NOTE — 'Pure chemicals' shall mean chemicals that do not contain impurities which affect the test results.

Table 1 Requirements for Baking Powder
(Clause 3.3)

SI No. (1)	Characteristic (2)	Requirement (3)	Method of Test, Ref to (4)
i)	Moisture, percent by mass, <i>Max</i>	5.0	5 of IS 6287
ii)	Available Carbon dioxide, percent by mass, <i>Min</i>	12.0	Annex B
iii)	Arsenic (as As), mg/kg, <i>Max</i>	0.5	12 of IS 6287 or 15 of IS 1699 or IS 11124*
iv)	Lead, mg/kg, <i>Max</i>	5.0	13 of IS 6287 or Annex G of IS 2124 or IS 12074*

NOTE — In case of any dispute, the method indicated by '*' shall be the referee method.

ANNEX A

(Clause 2)

LIST OF REFERRED STANDARDS

<i>IS No.</i>	<i>Title</i>	<i>IS No.</i>	<i>Title</i>
IS 1005 : 1992	Edible maize starch (corn flour) — Specification (<i>third revision</i>)	IS 2491 : 2013	Food hygiene — General principles — Code of practice (<i>third revision</i>)
IS 1006 : 1984	Specification for arrowroot starch (<i>second revision</i>)	IS 4905 : 2015	Random sampling and randomization procedures (<i>first revision</i>)
IS 1070 : 1992	Reagent grade water — Specification (<i>third revision</i>)	IS 6287 : 1985	Methods for sampling and analysis for sugar confectionery (<i>first revision</i>)
IS 1319 : 1983	Specification for edible tapioca starch (<i>second revision</i>)	IS 11124 : 1984	Method for atomic absorption spectrophotometric determination of arsenic
IS 1699 : 1995	Methods of sampling and test for food colours (<i>second revision</i>)	IS 12074 : 1987	Method for determination of lead by atomic absorption spectrophotometer
IS 2124 : 2000	Sodium bicarbonate — Specification (<i>second revision</i>)		

ANNEX B

[Table 1, Sl No. (ii)]

DETERMINATION OF AVAILABLE CARBON DIOXIDE

B-1 Two methods have been prescribed. Any one of these can be used depending on the test facilities available.

B-1.1 Method I**B-1.1.1 Apparatus**

B-1.1.1.1 *Schroedter's Alkalimeter* — as shown in Fig. 1

B-1.1.2 Reagent

B-1.1.2.1 *Sulphuric Acid* — sp gr 1.84

B-1.1.3 Procedure

B-1.1.3.1 Fill bulb A with water and bulb B with sulphuric acid to a height of 25 mm above the port C through which carbon dioxide escapes into the acid. Weigh the alkalimeter. Introduce about one gram of the sample through the side opening D, into the decomposition flask E. Weigh the alkalimeter again. Open the stopcock F and allow about 25 ml of water to flow into the flask E. Allow the initial vigorous reaction to subside. Place the apparatus over a low flame and boil the solution for about 3 minutes. Aspirate carbon dioxide-free air through the solution by applying suction at G, the air first passing through soda lime. Weigh the alkalimeter again.

B-1.1.4 Calculation

B-1.1.4.1 Available carbon dioxide, percent by mass

$$= \frac{100 \times (M_2 - M_1)}{(M_2 - M)}$$

where

M_2 = mass of alkalimeter with sample, before decomposition;

M_1 = mass of alkalimeter with sample, after decomposition; and

M = mass of alkalimeter before introducing the sample.

B-1.2 Method II**B-1.2.1 Apparatus**

B-1.2.1.1 A recommended apparatus of the gasometric assembly, as assembled, is shown in Fig. 2.

B-1.2.1.1.1 Assembly

The apparatus consists of a 250 ml, wide mouthed extraction flask A made of heat resistant glass, connected by a short bent glass tube to a rubber tube B. This is connected by a two-way stopcock C to a gas measuring tube D which is graduated in millilitres at 20 °C with zero mark at the point just below the top and graduated up to 500 ml. Through the other hole is passed a 40 ml burette H graduated in ml at 25 °C and numbered at 1 ml intervals. The gas measuring tube is connected to a levelling tube F through a rubber tube E having a pinchcock P to control the flow of solution.

B-1.2.2 Reagent**B-1.2.2.1 Displacement Solution**

Dissolve 100 g sodium chloride or sodium sulphate in 350 ml water. Add accurately 1 g sodium bicarbonate and 2 ml methyl orange (0.5 percent aqueous solution) and then enough sulphuric acid or hydrochloric acid to make just acidic (decidedly pink). Stir until all CO₂ is removed. This solution is used in gas measuring tube and levelling bulb and seldom needs correction.

B-1.2.3 Procedure

B-1.2.3.1 Accurately weigh 2.5 g sample into flask A. Using the two-way stopcock C. Connect with both gas measuring tube D and levelling tube F to atmosphere and fill them with displacement solution up to the zero mark of tube D. Connect decomposition flask A with rubber tube B and turn stopcock so that the gas measuring tube is connected to decomposition flask and disconnected from atmosphere. Fill the burette H with distilled water up to the 40 ml mark. Let apparatus stand 1 minute to 2 minutes so that the temperature and pressure within the apparatus comes to room conditions. Open stopcock (or pinchcock) P and bring down the solution level in glass levelling tube F to reduce pressure within apparatus. Collect the displacement solution in a glass beaker and reserve for re-use later. Slowly add to decomposition flask, from burette H, 35 ml of distilled water. To allow uniform mixing of contents, rotate decomposition flask with swirling action and then put it on a wire gauze over a tripod stand and heat it to boiling with a Bunsen or Burshane burner. To prevent overflowing of displacement solution in levelling tube fill to a level lower than the overflow capacity. Occasionally rotate the decomposition flask to ensure

uniform mixing of contents and complete evolution of CO_2 . Then the mixture in decomposition flask foams up and the foam reaches the neck of the flask, stop heating and quickly immerse decomposition flask in cold tap water kept in a tray below. Also pour water over the decomposition flask while rotating it to bring the contents to the temperature of water in the tray. When this happens wait for further five minutes to secure equilibrium. Equalize pressure in measuring tube by pouring solution in levelling tube, using the pinchcock P if necessary and read the volume V in the measuring tube.

B-1.2.4 Calculation

B-1.2.4.1 Deduct from this volume V, the volume of distilled water added namely 35 ml to get the corrected volume of CO_2 evolved after decomposition at atmospheric temperature and pressure.

From the following equation the volume of carbon dioxide at normal temperature and pressure is obtained:

$$V_2 = \frac{T_2}{P_2} \times \frac{P_1 V_1}{P_2 T_1}$$

where

P_1 = corrected barometric pressure at temperature T_1 ;

V_1 = $V - 35$ ml = corrected volume of CO_2 evolved after decomposition;

T_1 = observed temperature of displacement solution.

V_2 = volume of CO_2 calculated at normal temperature and pressure;

T_2 = normal temperature (273 °K or 0 °C); and

P_2 = normal pressure (760 mm);

Now one-gram mole (44 g) of carbon dioxide, at NTP, will occupy 22 400 ml, that is, 22 400 ml of CO_2 at NTP, weigh 44 g.

Therefore, V_2 ml CO_2 at NTP will weigh:

$$\frac{V_2}{22\,400} \times \frac{44}{1}$$

Now, $\frac{V_2}{22\,400} \times \frac{44}{1}$ g of carbon dioxide are obtained from 2.5 g of baking powder.

Therefore, available carbon dioxide percent by

$$\text{mass} = \frac{100}{2.5} \times \frac{V_2}{22\,400} \times \frac{44}{1}$$

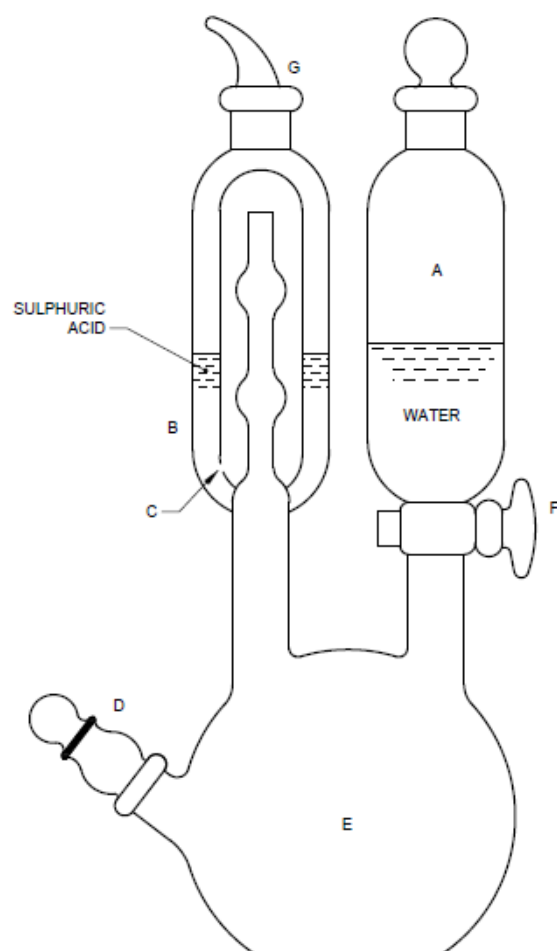


FIG. 1 SCHROEDTER'S ALKALIMETER

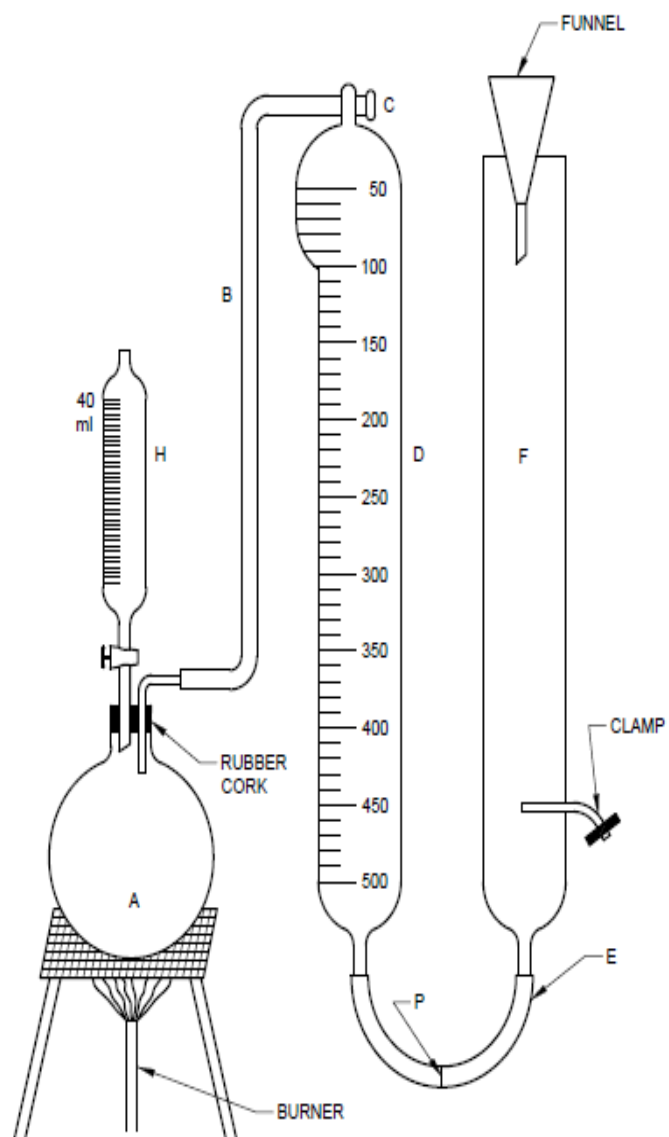


FIG. 2 GASOMETRIC ASSEMBLY

ANNEX C

(Clause 6)

SAMPLING OF BAKING POWDER

C-1 GENERAL REQUIREMENTS

C-1.1 In drawing, preparing, storing and handling test samples, the following precautions and directions shall be observed.

C-1.2 Samples shall be taken in a protected place not exposed to damp air, dust or soot.

C-1.3 The sampling instrument shall be clean and dry when used.

C-1.4 Precautions shall be taken to protect the samples, the material being sampled, the sampling instrument and the containers for samples from extraneous contamination.

C-1.5 The samples shall be placed in clean, odourless and dry glass containers. The sample containers shall be of such size that they are almost completely filled by the sample.

C-1.6 Each container shall be sealed air-tight after filling and marked with full details of sampling, batch or code number, name of the manufacturer, the nature of the product, the date of sampling, the number of samples taken from the lot and the size of the lot.

C-1.7 Samples shall be stored in such a manner that the temperature of the material does not vary unduly from the normal temperature.

C-1.8 Sampling shall be done by a person, agreed to between the purchaser and the vendor and in the presence of the purchaser (or his representative) and the vendor (or his representative).

C-2 SCALE OF SAMPLING

C-2.1 Lot

All the containers, in a single consignment, belonging to the same batch or manufacture shall constitute a lot. If the consignment is declared to consist of different batches of manufacture, the batches shall be marked separately and the groups of containers in each batch shall constitute separate lots.

C-2.1.1 For ascertaining the conformity of the material to the requirements of this specification, samples shall be tested from each lot separately.

C-2.2 The number of containers to be selected from a lot shall depend on the size of the lot, quantity of

material in the container and shall be as given in Table 2.

C-2.3 The containers to be selected for sampling shall be chosen at random from the lot and, for this purpose, random number tables given in IS 4905 shall be used.

C-2.4 In case such tables are not available, the following procedure may be adopted:

Starting from any container, count them as 1, 2, 3,....., r and so on, in one order. Every r^{th} container thus counted shall be chosen, r being the integral part of N/n , where N is the total number of containers in the lot and n the number of containers to be selected (see Table 2).

C-3 TEST SAMPLES AND REFEREE SAMPLES

C-3.1 Preparation of Individual Samples

Empty out the contents of the container on a sheet of paper and mix thoroughly. Cone and quarter as often as necessary till about 75 g of the material is left. From this take about 15 g of the material and divide it into three equal parts. Each part so obtained shall constitute an individual sample representing the container and shall be transferred immediately with particulars in C-1.6. The individual samples so obtained shall be divided into three sets in such a way that each set has a sample representing each selected container. One of these sets shall be marked for the purchaser, the other for the vendor and the third for the referee.

C-3.2 Preparation of a Composite Sample

From the material from each selected container remaining after the individual sample has been taken, equal quantities of material shall be taken and mixed together so as to form a composite sample weighing not less than 160 g. This composite sample shall be divided into three equal parts and transferred to clean dry glass containers and labelled with the particulars given in C-1.6. One of these composite samples shall be marked for the purchaser, the other for the vendor and the third for the referee.

C-3.3 Referee Samples

Referee samples shall consist of a set of individual samples (C-3.1), composite sample (C-3.2) marked

for this purpose and shall bear the seals of the purchaser and the vendor. These shall be kept at a place agreed to between the purchaser and the vendor so as to be used in case of a dispute between the two.

C-4 NUMBER OF TESTS

C-4.1 Tests for the requirements given in **3.1**, moisture and available carbon dioxide as in Table 1 shall be conducted on each of the samples constituting a set of individual samples (*see C-3.1*).

C-4.2 Tests for arsenic and lead as in Table 1 shall be conducted on the composite sample (*see C-3.1*).

C-5 CRITERIA FOR CONFORMITY

C-5.1 The lot shall be declared as conforming to all the requirements of the specification, if **C-5.1.1** and **C-5.1.2** are satisfied.

C-5.1.1 The test results on each of the individual samples for the determination of requirements given in **C-4.1** shall satisfy the corresponding specification requirements as in Table 1.

C-5.1.2 The test results on the composite sample for the requirements given in **C-4.2** shall satisfy the corresponding specification requirements as in Table 1.

Table 2 Number of Containers to be Selected for Sampling
(Clauses C-2.2 and C-4.1)

Sl No. (1)	Total Number of Containers in the Lot (2)	Number of Containers to be Selected (3)
i)	Up to 50	3
ii)	51 to 100	4
iii)	101 to 300	5
iv)	301 to 500	6
v)	501 and above	7

ANNEX D
(Foreword)

COMMITTEE COMPOSITION

Ready-to-Eat Food and Specialized Products Sectional Committee, FAD 24

<i>Organization</i>	<i>Representative(s)</i>
National Institute of Food Technology Entrepreneurship and Management, Sonipat	DR ASHUTOSH UPADHYAY (Chairperson)
ICAR — Central Institute of Post-Harvest Engineering & Technology (CIPHET), Ludhiana	DR NACHIKET KOTWALIWALE (Former Chairperson)
Agricultural & Processed Food Products Export Development Authority (APEDA), New Delhi	DR REEBA ABRAHAM
All India Food Processors Association, New Delhi	DR VAIBHAV KULKARNI DR A. K. TYAGI (<i>Alternate</i>)
Central Food Technological Research Institute, Mysore	DR P. PRABHASANKAR DR JYOTHI LAKSHMI (<i>Alternate</i>)
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Consumer Voice, New Delhi	SHRI M. A. U. KHAN
CSIR — Indian Institute of Toxicology Research, Lucknow	DR KAUSAR M. ANSARI DR SANDEEP SHARMA (<i>Alternate</i>)
Defense Food Research Laboratory, Mysore	DR R. KUMAR DR R. SHYLAJA (<i>Alternate</i>)
Food Safety & Standards Authority of India, New Delhi	KUMARI RUBY MISHRA
Haldiram Snacks Private Limited, Noida	
ICAR — Central Institute of Post-Harvest Engineering & Technology, Ludhiana	DR MRIDULA DEVI
Indian Confectionery Manufacturer Association, Noida	SHRI PRABHAKAR MISRA
ICAR — National Dairy Research Institute, Karnal	DR P. NARENDRA RAJU DR NEELAM UPADHYAY (<i>Alternate</i>)
Indian Institute of Packaging, Mumbai	DR TANWEER ALAM SHRI PON KUMAR (<i>Alternate</i>)
Indian Institute of Technology, Kharagpur	DR H. N. MISHRA
McCain Foods (India) Private Limited, New Delhi	KUMARI TINU SHARMA SHRI VIKAS KAUSHIK (<i>Alternate</i>)
National Dairy Development Board, Anand	SHRI ADITYA JAIN DR JITENDER SINGH (<i>Alternate</i>)

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Nestle India Limited, Gurgaon	SHRI ISWARYA MANI
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Member Secretary
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(FOOD AND AGRICULTURE), BIS

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Amendments Issued Since Publication

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